IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	Atty. Docket: 2004P00028WOUS
WILLEM L. IJZERMAN	Confirmation No.: 1856
Serial No.: 10/596,884	Examiner: Jeremiah Charles Hallenbeck-Huber
Filed: June 28, 2006	Group Art Unit: 2486

Title: A THREE-DIMENSIONAL DISPLAY

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellant herewith respectfully presents its Brief on Appeal as follows:

REAL PARTY IN INTEREST

The real party in interest is Koninklijke Philips Electronics N.V., a corporation of The Netherlands having an office and a place of business at Groenewoudseweg 1, Eindhoven, Netherlands 5621 BA.

RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge and belief, there are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1-23 are pending in the Application. Claims 1 and 19 are independent claims. Claims 1-23 are rejected in the Final Office Action that issued October 18, 2011. An Amendment After Final Action was submitted on December 19, 2011 including amendments to the claims. This rejection was upheld in the Advisory Action that mailed on January 6, 2012 that stated that the amendments to the claims would be entered for purposes of appeal. Claims 1-23 as amended are the subject of this appeal.

STATUS OF AMENDMENTS

An Amendment After Final Action was submitted on December 19, 2011 in response to the Final Office Action of October 18, 2011. The Advisory Action indicated that the Amendment After Final Action will be entered but does not place the application in condition for allowance. This Appeal Brief is in response to the Final Office Action that rejected claims 1-23 and the Advisory Action that upheld that rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

The present invention, for example as claimed in claim 1, relates to an apparatus for displaying an image in 3D (e.g., see present application, page 5, line 28 to page 6, line 12), the apparatus comprising: at least one display unit for producing a beam of a 2D frame (e.g., see present application, page 4, lines 11-32) including at least one row of pixels having sub-pixels corresponding to a plurality of elemental regions of the image in different view directions (e.g., see present application, page 6, lines 13-32); an optical lens arrangement to direct the beam from the plurality of elemental regions into respective divergent beams corresponding to the different view directions (e.g., see present application, page 5, line 28 to page 6, line 12); a driver connected to the display unit to drive the at least one row of pixels of the display unit so as to refresh the 2D frame (e.g., see present application, page 5, lines 1-13); an optical scanning system having a rotary mirror element (e.g., see present application, page 4, lines 11-32) to receive the divergent beams from the lens arrangement (e.g., see present application, page 5, line 28 to page 6, line 12; page 8, line 13 to page 9, line 5); and a control unit connected to the driver for changing a tilt of the rotary mirror element between each 2D frame display (e.g., see present application, page 5, lines 1-13), causing the rows of the 2D frame to successively display as rows of a 3D image frame (e.g., see present application, page 5, lines 1-13).

The present invention, for example as claimed in claim 19 relates to a method of displaying an image in 3D (e.g., see present application, page 5, line 28 to page 6, line 12), the method comprising acts of: providing a beam of a 2D frame (e.g., see present

application, page 4, lines 11-32) including at least one row of pixels, each pixel including sub-pixels corresponding to a plurality of elemental regions of the image in different view directions (e.g., see present application, page 6, lines 13-32); directing the beam from the a plurality of elemental regions into respective divergent beams corresponding to the different view directions (e.g., see present application, page 5, line 28 to page 6, line 12), successively refreshing the 2D frame (e.g., see present application, page 5, lines 1-13), receiving the divergent beams at a scanning device having a rotary mirror element (e.g., see present application, page 5, line 28 to page 6, line 12; page 8, line 13 to page 9, line 5), tilting the rotary mirror element between each 2D frame display (e.g., see present application, page 5, lines 1-13) and displaying them as rows of the 3D image frame (e.g., see present application, page 5, lines 1-13).

It should be explicitly noted that it is not the Appellant's intention that the present invention be limited to operation within the illustrative device and method described above beyond what is required by the claim language. Further description of the illustrative device and method is provided above indicating portions of the claims which cover the illustrative device and method merely for compliance with requirements of this appeal without intending any further interpreted limitations be read into the claims as presented.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 19-22 of U.S. Patent Application Serial No. 10/596,884 are unpatentable under 35 U.S.C. §102(b) over U.S. Patent No. 5,696,552 to Aritake et al. ("Aritake").

Whether claims 1-9 and 13-15 of U.S. Patent Application Serial No. 10/596,884 are unpatentable under 35 U.S.C. §103(a) over Aritake in view of U.S. Patent No. 5,808,792 to Woodgate et al. ("Woodgate").

Whether claims 10-12 of U.S. Patent Application Serial No. 10/596,884 are unpatentable under 35 U.S.C. §103(a) over Aritake in view of Woodgate and further in view of U.S. Patent No. 4,163,990 to Hodges ("Hodges").

Whether claims 16-17 of U.S. Patent Application Serial No. 10/596,884 are unpatentable under 35 U.S.C. §103(a) over Aritake in view of Woodgate and further in view of U.S. Patent No. 5,111,103 to DuBrucq ("DuBrucq").

Whether claims 18 and 23 of U.S. Patent Application Serial No. 10/596,884 are obvious under 35 U.S.C. §103(a) over Aritake in view of Woodgate and further in view of U.S. Patent No. 5,465,175 Woodgate et al. ("Woodgate2").

ARGUMENT

Claims 19-22 are said to be unpatentable over Aritake; and

Claims 1-9 and 13-15 are said to be obvious over Aritake in view Woodgate

Appellant respectfully requests the Board to address the patentability of the independent claims, and further the dependent claims as respectively depending from one of independent claims based on the requirements of the independent claims. This position is provided for the specific and stated purpose of simplifying the current issues on appeal. However, Appellant herein specifically reserves the right to argue and address the patentability of the dependent claims at a later date should the separately patentable subject matter of the dependent claims later become an issue. Accordingly, this limitation of the subject matter presented for appeal herein, specifically limited to discussions of the patentability of the independent claims is not intended as a waiver of Appellant's right to argue the patentability of the further claims and claim elements at that later time.

Claim 1 recites "at least one display unit for producing a beam of a 2D frame including at least one row of pixels having sub-pixels corresponding to a plurality of elemental regions of the image in different view directions". The Final Office Action takes a position that Aritake, Figure 35 and col. 15, line 46 to col. 16, line 10 show the quoted claims recitation.

However, a close review of the two referenced paragraphs and the rest of Aritake, reveals absence of a disclosure of "at least one row of pixels having sub-pixels corresponding to a plurality of elemental regions of the image in different view directions",

as recited in claim 1, for example. Instead, Aritake discusses Figure 34 as showing "2-dimensional images DG_{11} to DG_{1n}, . . . , DG_{n1} to DG_{nn} which are obtained by dividing the 2-dimensional image of each region are stored into the divided 2-dimensional image storing table 132 every virtual opening areas A_1 to A_n." It is respectfully submitted that this does not teach, disclose or suggest "a plurality of elemental regions of the image in different view directions" as for example recited in claim 1.

The Advisory Action refutes the Appellant's position as follows: "As noted In col. 15 lines 46-63 the phase display 122 and image display 120 receive divided two dimensional images corresponding to virtual opening areas A1-An. Col. 15 line 64 to col. 15 line 10 further discloses that the pixels, and sub pixels, of the image from display 120 are deflected by the phase display 122 so that an observer can see a solid image. By disclosing that the pixels are deflected by the phase display 122 so as to correspond to virtual opening areas A1-An Aritake discloses sub-pixels corresponding to a plurality of elemental regions of the image in different view directions."

Appellant respectfully refutes this position. Deflection of the pixels by the phase display 122 creates deflected pixels. As stated in Aritake DG_{n1} to DG_{nn} "are obtained by dividing the 2-dimensional image of each region" this does not teach, disclose, suggest or correspond "to a plurality of elemental regions of the image in different view directions".

Further, with regard to FIG. 30 of Aritake the Advisory Action takes the position that this Figure "clearly shows image regions directed in different view direction to correspond to virtual openings Ai and Ai+k". In response the Appellant notes that it is not at all clear what

Figure 30 illustrates. In Aritake, it is stated that "FIG. 30 is an explanatory diagram showing the recognition of a solid image according to the second embodiment" (See, Aritake, col. 4, lines 54-55.) which has nothing to do with the claims recitation. In addition, the further description of that Figure in Aritake (see, Aritake, col. 14, line 59 through col. 15, 3) fails to disclose "at least one row of pixels having sub-pixels corresponding to a plurality of elemental regions of the image in different view directions".

Further, it is undisputed as stated at page 5 of the Office Action that "Aritake does not disclose a display and optical lens arrangement". Instead Woodgate is introduced to disclose the two admittedly missing elements of Aritake. However, it is respectfully submitted that the reliance on Woodgate is misplaced.

With regard to Woodgate, the Final Office Action references FIGs. 9, 10, and 12, col. 8 lines 25-32 and col. 7 lines 32-48. However, these referenced figures and paragraphs and the rest of Woodgate fail to disclose the "plurality of elemental regions of the image in different view directions", as recited in the claims.

It is respectfully submitted that the claims are not anticipated or made obvious by the teachings of the presented prior art references. For example, Aritake in view of Woodgate does not teach, disclose or suggest, amongst other patentable elements, (illustrative emphasis added) "at least one display unit for producing a beam of a 2D frame including at least one row of pixels having sub-pixels corresponding to a plurality of elemental regions of the image in different view directions; an optical lens arrangement to direct the beam from

the plurality of elemental regions into respective divergent beams corresponding to the different view directions" as recited in claim 1 and as similarly recited in claim 19.

Based on the foregoing, the Appellants respectfully submit that independent claims 1, and 19 are patentable over Aritake alone and in view of Woodgate and notice to this effect is earnestly solicited.

The dependent claims respectively depend from one of the independent claims and accordingly are allowable for at least this reason as well as for the separately patentable elements contained in each of said claims. Accordingly, separate consideration of each of the dependent claims is respectfully requested.

Claims 10-12 are said to be obvious over Aritake in view of Woodgate and further in view of Hodges

Hodges is cited for allegedly showing elements of the dependent claim yet does not cure the deficiencies in each of Aritake and Woodgate. Accordingly, it is respectfully submitted that claims 10-12 are allowable at least based on dependence from independent claim 1.

Claims 16-17 are said to be obvious over Aritake in view of Woodgate and further in view of DuBrucq

DuBrucq is cited for allegedly showing elements of the dependent claim yet does not cure the deficiencies in each of Aritake and Woodgate. Accordingly, it is respectfully

submitted that claims 16-17 are allowable at least based on dependence from independent claim 1.

Claims 18 and 23 are said to be obvious over Aritake in view of Woodgate and further in view of Woodgate2

Woodgate2is cited for allegedly showing elements of the dependent claim yet does not cure the deficiencies in each of Aritake and Woodgate. Accordingly, it is respectfully submitted that claims 18 and 23 are allowable at least based on dependence from one of independent claims 1 and 19.

Based on the foregoing, the Appellant respectfully submits that the independent claims are patentable and notice to this effect is earnestly solicited. The dependent claims respectively depend from one of the independent claims and accordingly are allowable for at least this reason as well as for the separately patentable elements contained in each of the claims. Accordingly, separate consideration of each of the dependent claims is respectfully requested.

In addition, Appellant denies any statement, position or averment of the Examiner that is not specifically addressed by the foregoing argument and response. Any rejections and/or points of argument not addressed would appear to be moot in view of the presented remarks. However, the Appellant reserves the right to submit further arguments in support of the above stated position, should that become necessary. No arguments are waived and none of the Examiner's statements are conceded.

Appellant has made a diligent and sincere effort to place this application in condition for immediate allowance and notice to this effect is earnestly solicited.

CONCLUSION

Claims 1-23 are patentable over Aritake in view of Woodgate alone and in any combination of Hodges, DuBrucq and Woodgate2. Thus the Examiner's rejection of claims 1-23 should be reversed.

Respectfully submitted,

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APPENDIX A

CLAIMS ON APPEAL

1. (Previously presented) An apparatus for displaying an image in 3D, the apparatus comprising:

at least one display unit for producing a beam of a 2D frame including at least one row of pixels having sub-pixels corresponding to a plurality of elemental regions of the image in different view directions;

an optical lens arrangement to direct the beam from the plurality of elemental regions into respective divergent beams corresponding to the different view directions;

a driver connected to the display unit to drive the at least one row of pixels of the display unit so as to refresh the 2D frame;

an optical scanning system having a rotary mirror element to receive the divergent beams from the lens arrangement; and

a control unit connected to the driver for changing a tilt of the rotary mirror element between each 2D frame display, causing the rows of the 2D frame to successively display as rows of a 3D image frame.

2. (Previously presented) The apparatus according to claim 1, further comprising a display screen, the scanning system being operable to direct the beams corresponding to the successive rows of the 3D image frame onto the screen.

3. (Previously presented) The apparatus according to claim 2, wherein the display screen comprises a diffuser for spreading the beams in a direction transverse to the row direction.

4. (Previously presented) The apparatus according to claim 3, wherein the diffuser comprises lenticular lenses positioned generally parallel to the row direction.

5. (Previously presented) The apparatus according to claim 1, further comprising a focus unit for focusing the elemental regions of rows of images onto the optical lens arrangement.

6. (Previously presented) The apparatus according to claim 5, wherein the focus unit comprises a plurality of converging lenses with different focal lengths in the horizontal and vertical direction in order to match the dimensions of the elemental region of rows with the dimensions of the optical lens arrangement.

7. (Previously presented) The apparatus according to claim 1, wherein the optical lens arrangement comprises lenticular lenses.

8. (Previously presented) The apparatus according to claim 1, wherein the rotary mirror element reflects the divergent beams.

9. (Previously presented) The apparatus according to claim 8, wherein the rotary mirror element is a rotating mirror or a rotating polygon with reflective surfaces.

10. (Previously presented) The apparatus according to claim 8, wherein the scanning system further comprises a concave mirror to receive the divergent beams from the rotary mirror element and display them as rows of the 3D image frame.

11. (Previously presented) The apparatus according to claim 10, wherein the scanning system comprises a lens positioned in relation to the rotary mirror element and the concave mirror such that the rotary mirror element does not perturb the focusing of the 3D image in the direction transverse to the row direction.

12. (Previously presented) The apparatus according to claim 10, wherein the scanning system further comprises side mirrors, the side mirrors and the concave mirror are configured to focus the divergent beams containing information from one pixel onto a small area of the rows of the 3D image frame.

13. (Previously presented) The apparatus of claim 1, wherein the sub-pixels provide enough elemental regions such that each of more than one observer can observe the 3D image simultaneously and each of the more than one observer sees a slightly different view.

14. (Previously presented) The apparatus of claim 1, wherein there are at least 50 elemental regions for each image.

15. (Previously presented) The apparatus of claim 1, wherein for each elemental region there is another elemental region such that the images relating to the two elemental regions are shifted by less or equal to the parallax between the eyes.

16. (Previously presented) The apparatus of claim 1, wherein a plurality of display units are placed adjacent to each other in the direction parallel to the row direction and wherein the driver is configured to display different information on each display such that all the information corresponding to one row of the 3D image is displayed simultaneously across the plurality of the display units.

17. (Previously presented) The apparatus of claim 1, wherein a plurality of display units are placed adjacent to each other in the direction transverse to the row direction and wherein the driver is configured to display information on the plurality of displays relating to different rows of the 3D image frame and the scanning system comprises a plurality of rotary mirror elements for scanning the information onto said rows.

18. (Previously presented) The apparatus according to claim 1, further comprising at least one of a domestic video and television display.

19. (Previously presented) A method of displaying an image in 3D, the method comprising acts of:

providing a beam of a 2D frame including at least one row of pixels, each pixel including sub-pixels corresponding to a plurality of elemental regions of the image in different view directions;

directing the beam from the a plurality of elemental regions into respective divergent beams corresponding to the different view directions;

successively refreshing the 2D frame, receiving the divergent beams at a scanning device having a rotary mirror element, tilting the rotary mirror element between each 2D frame display and displaying them as rows of the 3D image frame.

20. (Previously presented) The method of claim 19, further comprising an act of spreading the light containing the divergent beams in a direction transverse to the row direction in order to enlarge the viewing angle in the direction transverse to the row direction.

21. (Previously presented) The method of claim 19, further comprising acts of:

displaying the 3D image on a display screen, and

separating the beams from different elemental regions before they are displayed on the display screen.

22. (Previously presented) The method of claim 19, comprising an act of creating a 3D pixel on the display screen by directing all the separate beams corresponding to different sub-pixels of the same pixel onto the same small area of the display screen, such that the 3D pixel emits light corresponding to different views of the same point of an image source in different directions.

23. (Previously presented) The method of claim 19, wherein the 3D image is displayed on at least one of a domestic television and video projection.

APPENDIX B

Evidence on Appeal

None

APPENDIX C

Related Proceedings of Appeal

None